

IN THE CLAIMS:

1. (Currently Amended) Method for monitoring movable parts of a machine, such as an industrial robot wherein measured values of at least two different measured quantities are detected and at least one of these measured values is processed to a first measure result in such a way that it is comparable with the measured value of another measured quantity or a second measure result obtained as a result thereof, that the first measure result is compared with the measured value of another measured quantity or a measure result obtained as a result thereof and that a signal characterizing the comparison result is provided, wherein actual measured values of measured quantities or results are compared with reference values.

5
2. (Currently Amended) Method according to the preamble of claim 1, particularly according to claim 1, wherein material strains on parts of the machine are measured as at least one measured quantity.

3. (Currently Amended) Method according to claim 2, wherein the material strains are measured by means of at least one transducer (8).

4. (Currently Amended) Method according to claim 2, wherein the material strains are measured by means of a strain gauge (8).

5. (Original) Method according to claim 2, wherein the material strains are measured

by means of piezoelectric or light guide-based pickups.

6. (Currently Amended) Method according to claim 1, wherein the material strains are measured by means of transducers ~~(8)~~ positioned on at least two surfaces of a robot part.

7. (Canceled)

8. (Currently Amended) Method according to claim [[7]] 1, wherein actual measured values of measured quantities and/or measure results are compared with reference values, whilst taking account of tolerances.

9. (Original) Method according to claim 8, wherein tolerances are taken into account by forming a reference corridor to a reference curve.

10. (Original) Method according to claim 1, wherein in the case of divergences from expected measured values and/or measure results, the robot is stopped.

11. (Currently Amended) Machine with movable parts, such as in particular an industrial robot, characterized by comprising: at least two measuring devices for detecting different measured quantities as measured values on movable parts of the machine[[,]]; at least one processing unit ~~(12, 13, 14)~~ for at least one measured value of a measured quantity for

5

processing the same into a first measure result comparable with another measured value of another measured quantity or a second measure result obtained therefrom, ^{and} by a comparison unit (15) for comparing the first measure result with at least the measured value of another measured quantity or a second measure result obtained as a result thereof, wherein the comparison unit is part of a monitoring device with the comparison unit for comparing measured values of measured quantities or results with reference values.

12. (Currently Amended) Machine according to the preamble of claim 11, particularly according to claim 11, characterized by further comprising: measuring devices (8) for determining material strains.

13. (Original) Machine according to claim 12, wherein the devices for determining material strains are constructed as transducers.

14. (Original) Machine according to claim 12, wherein the devices for determining material strains are constructed as strain gauges.

15. (Original) Machine according to claim 12, wherein the devices for determining material strains are constructed as light guide based pickups.

16. (Original) Machine according to claim 12, wherein in each case at least one device

for determining material strains is placed on at least two surfaces of a robot part.

17. (Currently Amended) Machine according to claim 12, characterized by a wherein:
the monitoring device (11) to which is connected to at least one device for determining material strains on machine parts.

18. (Currently Amended) Machine according to claim 16, wherein the monitoring device (11) has units for monitoring at least elongations of the machine structure and a further measured quantity.

19. (Currently Amended) Machine according to claim 16, wherein the monitoring device (11) has a the comparison unit device (15) for comparing compares the actual measured values and/or measure results with the reference values provided as predetermined models for robot movements (16).

20. (Currently Amended) Machine according to claim 18, wherein the monitoring device has a device (17) for disconnecting the machine.